Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

The absence of its lines in the former and the faintness in the latter can be accounted for by the reasonable assumption that only a small amount of the element is present in the solar atmosphere. The principal lines of caesium are λλ8943 and 8521, well in the infra-red. Photographs of the region including the more refrangible of these will be made when opportunity offers.

HENRY NORRIS RUSSELL.

Mount Wilson Observatory, July 2, 1921.

THE DIAMETER OF ALPHA SCORPII BY THE INTERFEROMETER METHOD*

Observations of stellar diameters up to May 31st were given in the June number of these PUBLICATIONS. Additional measures have since been made of *Arcturus*, *Antares*, and other stars.

Arcturus, under improved conditions of seeing, showed weak residual fringes at 19.6 feet, the limit of the beam, and it is estimated that they will vanish at 21 feet. Using a value of λ = 5600 A, the revised angular diameter is 0″.022. According to van Maanen and Russell the most probable value of the parallax is 0″.095; the corresponding linear diameter is 21,000,000 miles.

Antares lies so far to the south that its images are drawn out into spectra by the Earth's atmosphere. There seems, however, to be no difference between the results obtained by direct observation and those with a deep yellow filter. The fringes disappear at 11.5 feet, but to make allowance for the influence of seeing, as described in section 2 below, the value adopted is 12 feet. Assuming λ = 5750 A (Class Ma), the value of the angular diameter is 0″.040. Russell's predicted value for this star is 0″.028; the value derived with the aid of the measure of *α Orionis* is 0″.039. There is some question as to the value of the parallax. If it is assumed that *α Scorpii* belongs to the *Scorpius* group, the resulting value of the parallax is 0″.0085 and the diameter 430,000,000 miles. If, however, we give the same weight to this value and to the mean of the measured parallaxes, we find 0″.013, and for the diameter 280,000,000 miles. Either of these values is greater than that obtained for *Betelgeuse*, namely, 218,000,000 miles, which depends on an angular diameter 0″.047 and parallax 0″.020.

In fair seeing *β Pegasi* (magnitude 2.6) has shown no fringes beyond 18 feet, but the images are a little faint and further observations will be necessary to check this result.

There are four important factors to be considered in judging whether the disappearance of the fringes is real and not merely apparent.

1. *Adjustment. a.* The instrument is checked for adjustment by observing interference fringes on a neighboring bright star whose diameter is too small for measurement with the beam. When the distance between the stars becomes large, say 30°, flexure in the telescope and beam disturbs the adjustments in the transfer from one star to another and makes the setting for equality of path uncertain; accordingly use is made of method *b*.

b. A continuous series of observations is made upon the star whose diameter is to be measured, beginning with the mirrors close together, increasing their separation by steps of 6 or 12 inches to the point of disappearance and then returning a step or two until reappearance takes place. This method is used a great deal as the variations in adjustment are very small.

2. *Seeing.* The quality of the seeing plays a considerable part in the disappearance of the fringes with the wider separations of the mirrors. With fixed mirrors the visibility of the fringes in variable seeing will vary from zero to fifty per cent or more of the full visibility of the reference fringes; the reference fringes themselves also vary, but to a lesser degree. On nights of fairly steady seeing a series of continuously decreasing visibilities will be obtained and a value for complete disappearance will be found which is smaller than that obtained on nights of the best seeing.

3. *Brightness of Image.* The present apertures contain about 18 square inches and in fair seeing observations are made on stars to magnitude 2.5. On fainter stars it is difficult to be certain of results near the point where the fringes vanish. Experimental work shows that as the apertures are decreased in size the fringes, for a given star, vanish for smaller separations of the mirrors than they do with larger apertures.

4. *Magnification.* The apparent size of the fringe pattern is dependent upon the focal length of the telescope, the separation of the inner mirrors, and the magnifying power of the eyepiece. If the fringe pattern is too fine, its visibility decreases more rapidly than that of a coarse pattern, and this fact leads to a reduction in the separation of the mirrors for disappearance of the fringes.

F. G. PEASE.

Mount Wilson Observatory, July 14, 1921.